

In the Claims

1. - 12. (Cancelled)

13. (Currently Amended)) A method for calibrating a direction-finding antenna and a receiver circuit to which it is coupled in a radio telecommunications system, said receiver circuit including signal-phase-sensitive direction-finding signal-processing equipment, comprising the step of;

providing a near-field calibration source comprising a radio transmitter within a coverage area of said antenna;

transmitting a calibration signal from said source for reception by said antenna;

processing said received calibration signal in said receiver circuit to generate an output; and

comparing said output with a predetermined reference synchronised with said calibration signal to assess calibration of said antenna and said receiver circuit.

14. (Currently Amended) A method for calibrating a direction-finding antenna coupled to a receiver circuit situated at a cell site of a cellular radio telecommunications system, a communications transceiver for communicating with mobile stations of said system also being situated at said cell site, comprising the steps of;

providing a radio transceiver beacon having at least partial transmission and reception functionality of one of said mobile stations, at a predetermined, known position at a known bearing and/or distance from said cell site;

controlling said communications transceiver to set up a call with said beacon during which said beacon transmits signals to said cell site;

receiving said signals at said direction-finding antenna; and

3

processing said received signals in said receiver circuit to estimate a bearing from said cell site to said beacon and/or a distance between said cell site and said beacon and comparing said estimate or estimates with said known bearing and/or distance.

15. (Original) A method according to claim 14, in which said step of providing said beacon comprises providing a mobile station compatible with said telecommunications system.

16. (Original) A method according to claim 14, in which said beacon is provided at said position such that it can communicate with more than one cell site in order to calibrate direction finding antennas and receiver circuits at each said cell site.

B1
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17. (Original) A method for calibrating a direction finding antenna situated at a first cell site of a cellular radio telecommunications system, comprising the steps of;

providing a transmitter beacon at a second cell site adjacent to said first cell site;

transmitting a signal from said beacon;

receiving said signal at said direction-finding antenna; and

processing said received signal using receiver circuitry coupled to said direction finding antenna to estimate a bearing from said first cell site to said second cell site, comparing said estimate with a known bearing from said first cell site to said second cell site, and calibrating said direction finding antenna and/or said receiver circuitry accordingly.

18. (Original) A method according to claim 17, in which said radio telecommunications system is a CDMA (code division multiple access) system and said signal transmitted by said beacon is a narrowband signal within or near the allocated CDMA bandwidth.

19. (Original) A method according to claim 17, in which said signal transmitted by said beacon can be used to calibrate direction finding antennas at a plurality of adjacent cell sites.

20. (Currently Amended) A method for calibrating a direction finding antenna and/or associated receiver circuitry at a cell site of a radio telecommunications system, comprising the step of selecting one or more of the calibration methods of ~~[injecting a calibration signal into said circuitry near said antenna,]~~ providing a near-field calibration source, providing a radio transceiver beacon and providing a radio transmitter beacon at an adjacent cell site.

21. - 28. (Cancelled)

29. (Currently Amended) An apparatus for calibrating a direction finding antenna and a receiver circuit coupled thereto in a radio telecommunications system, said receiver circuit including phase-sensitive direction-finding signal processing equipment, comprising;

- a support for said antenna;
- a near-field calibration source comprising a radio transmitter mounted on a calibration source support extending from said antenna support;
- a calibration signal generator coupled to said calibration source for transmitting a calibration signal from said calibration source for reception by said antenna and processing by said receiver circuit to generate an output; and
- a comparator for comparing said output with a reference synchronised with said calibration signal to assess calibration of said antenna and said receiver circuit.

30. (Amended) An apparatus for calibrating a direction finding antenna at a cell site of a cellular radio telecommunications system, a transceiver for communicating with mobile stations also being situated at said cell site, comprising;

5

a radio transceiver beacon having at least partial transmission and reception functionality of one of said mobile stations, situated at a predetermined location at a known bearing and/or distance from said cell site;

a controller at said cell site for controlling said transceiver to set up a call with said beacon during which said beacon transmits signals to said cell site;

a receiver circuit coupled to said direction finding antenna for processing said transmitted signals as received at said direction finding antenna and for estimating a bearing from said cell site to said beacon and/or a distance from said cell site to said beacon; and

a comparator for comparing said estimated bearing and/or distance with said known bearing and/or distance.

31. (Original) A beacon for use in an apparatus as defined in claim 30.

32. (Original) A beacon according to claim 31, comprising a mobile station compatible with said telecommunications system.

33. (Original) An apparatus for calibrating a direction finding antenna and/or a receiver circuit coupled thereto situated at a first cell site of a cellular radio telecommunications system, comprising;

a transmitter beacon situated at a second cell site adjacent to said first cell site;

a calibration signal generator coupled to said beacon for causing said beacon to transmit a calibration signal;

said receiver circuit coupled to said direction finding antenna for processing said calibration signal as received by said direction finding antenna to generate an estimated bearing from said first cell site to said second cell site;

a comparator coupled to said receiver circuit for comparing said estimated bearing with a known bearing from said first cell site to said second cell site; and

6

a calibrator for calibrating said direction finding antenna and/or said receiver circuit according to said comparison.

34. (Original) An apparatus according to claim 33, in which said radio telecommunications system is a CDMA system and said calibration signal is a narrowband signal within a guardband of the allocated CDMA bandwidth.

35. (Original) A calibration beacon as defined in claim 33.
